

## **"MULTI-INPUT, MULTI-OUTPUT MOTION CONTROL FOR LITHOGRAPHY SYSTEM"**

### **Related Applications**

This application is a continuation-in-part of U.S. Application No. 09/491,969, filed January 27, 2000, which claims the benefit of U.S. Application No. 60/117,671, filed January 28, 1999, and is a continuation-in-part of U.S. application No. 09/261,475, filed February 26, 1999 (now U.S. Patent No. 6,404,107), which is a continuation-in-part of U.S. Application No. 08/943,645, filed October 3, 1997 (now U.S. Patent No. 6,069,433), which is a continuation of U.S. Application No. 08/188,145, filed January 27, 1994 (now U.S. Patent No. 6,420,819), the disclosures of each of which are hereby incorporated by reference.

### **Background of the Invention**

In the competitive marketplace which exists for automated surface-mount (SMT) electronics equipment, including systems for fabricating electronics equipment or components, improvements in accuracy and speed are a significant advantage. Such equipment is often used in fabricating semiconductor chips, printed circuit boards, liquid crystal displays, and thin film devices, and may feature multiple gantry/head assemblies, linear motors, photoimaging systems, etching systems, and/or a number of other technologies. The present invention relates to devices and methods for reducing vibration inherent in such equipment during operation thereby to improve the speed and/or accuracy of such equipment.

For example, modern photolithography tools require extremely high exposure accuracy. This can only be achieved if the levels of elastic displacement at crucial points in the tool do not exceed several nano-meters. Since lithography tools contain numerous moving parts such as the reticle and wafer stages, they are subject to persistent disturbing forces acting on their structure. Moreover, the tool structure is subject to environment disturbances such as floor vibrations and